get the elementary working knowledge of mathematical analysis, *including integral calculus*, which is rapidly becoming indispensable for students of the natural and social sciences. Moreover, he must deal with complicated technique in each introductory course; and must study many topics apart from their uses in other subjects, thus missing their full significance and gaining little facility in drawing upon one subject for help in another.

"To avoid these disadvantages of the separate-subject plan the unified course presented here has been evolved. This enables even those students who can take only one semester's work to get some idea of differential and integral calculus, trigonometry, and logarithms. And specialist students, as experience has shown, acquire an excellent command of mathematical tools by first getting a bird's-eye view of the field, and then proceeding to perfect their technique.

"A regular course in calculus, following this, can proceed more rapidly than usual, include more advanced topics, and give a fine grasp: the principles and processes have become an old story. And the regular course in analytic geometry can be devoted to a genuine study of the geometrical properties of loci, since most of the type equations, basic formulas, and calculus methods are already familiar.

"The materials presented here have been thoroughly tried out with the freshman classes in Reed College during the past nine years. Problems and methods which have proved unsatisfactory have been eliminated. Care has been taken to make the concepts tangible, relate them to the familiar ideas of daily life, exhibit practical applications, and develop the attitude of investigation. . . .

"The course as given at Reed College takes four hours a week through the year, the number of lessons devoted to the several chapters, when taken complete, having run about as follows: 14, 4, 14, 8, 11, 12, 11, 16, 5, 7, 10, 6, 6, 5, 4. . . . The course is adapted to students of widely differing preparations. A knowledge of plane and solid geometry and of algebra through quadratics is the most suitable equipment; but a number of students who had had only two years of secondary mathematics have carried the course very well. On the other hand, students who have already taken trigonometry and college algebra find in the present course very little that merely duplicates their former work."

Contents—A preliminary word to students, 1–2; Chapter I: Functions and graphs (Some fundamental problems of variation: rates, mean values, extremes, zero values, formulas, etc.), 3–57; II: Some basic ideas analyzed (Instantaneous rates, tangents, areas, etc., as limits), 58–75; III: Differentiation (Derivatives of polynomials and u^n. Rates, extremes, etc.), 76–125; IV: Integration ($\int x^n dx$. Area, volume, momentum, work, fluid pressure, falling bodies, etc.), 126–155; V: Trigonometric functions (Solution of right and oblique triangles. Applications), 156–188; VI: Logarithms (Numerical calculations. Compound interest. Triangles), 189–235; VII: Logarithmic and exponential functions, 236–270; VIII: Rectangular coördinates (Mapping. Motion. *Analytic geometry:* line, circle, parabola, ellipse, hyperbola; translation, intersections), 271–325; IX: Solution of equations (Quadratics: $b^2 - 4ac$. Rational roots of higher equations. Horner's and Newton's methods), 326–342; X: Polar coördinates and trigonometric functions (Definitions. Radians. Periodic variations. Derivatives), 343–367; XI: Trigonometric analysis (Basic identities. Equations. More calculus. Involute. Cycloid. *S.H.M.* Damped oscillations. Addition formulas. Sums and products, etc.), 368–391; XII: Definite integrals (Summation of "elements": length, surface of revolution, etc. Plotting a surface. Double integration. Partial derivatives. Simpson's rule), 392–414; XIII: Progressions and series (*A.P.* and *G.P.* Investment theory. Maclaurin series. Calculation of functions. Binomia. theorem), 415–439; XIV: Permutations, combinations and probability ($P_{n,r}$; $C_{n,r}$. Chancel Normal probability curve. Least squares), 440–459; XV: Complex number system (Definition. Geometric representation. Operations. Roots of unity. Application), 460–472; Retrospect and prospect, 472–483; Appendix (Proofs for reference. Formulas. Integrals. Numerical tables: roots, natural and common logarithms, trigonometric functions for radians or degrees), 485–508; Index, 509–512.

Analytic Geometry with Introductory Chapter on the Calculus. By C. I. PALMER and W. C. KRATHWOHL. New York, McGraw-Hill Book Co., 1921. 12mo. 14 + 347 pages. Price $2.50.

Preface: "The object of this book is to present analytic geometry to the student in as natural and simple a manner as possible without losing mathematical rigor. The average student thinks visually instead of abstractly, and it is for the average student that this work has been written.

It was prepared primarily to meet the requirements in mathematics for the second half of the first year at the Armour Institute of Technology. To make it adaptable to courses in other institutions of learning certain topics not usually taught in an engineering school have been added.

"While it is useless to claim any great originality in treatment or in the selection of subject matter, the methods and illustrations have been thoroughly tested in the class room. It is believed that the topics are so presented as to bring the ideas within the grasp of students found in classes where mathematics is a required subject. No attempt has been made to be novel only; but the best ideas and treatment have been used, no matter how often they have appeared in other works on the subject.

"The following points are to be especially noted:

(1) The great central idea is the passing from the geometric to the analytic and *vice versa*. This idea is held consistently throughout the book.

(2) In the beginning a broad foundation is laid in the algebraic treatment of geometric ideas. Here the student should acquire the analytic method if he is to make a success of the course.

(3) Transformation of coördinates is given early and used frequently throughout the book, not confined to a single chapter as is so frequently the case. The same may be said of polar coordinates.

(4) Fundamental concepts are dealt with in an informal as well as in a formal manner. The informal often fixes and clarifies the ideas where the formal does not.

(5) Numerous illustrative examples are worked out in order that the student may get a clear idea of the methods to be used in the solution of problems.

(6) The conic sections are treated from the starting point of the *focus* and *directrix* definition.

(7) Because of its great importance in engineering practice the empirical equation is dealt with more completely than is usual. This treatment has been made as elementary as possible, but sufficiently comprehensive to enable one to solve the average problem in empirical equations.

(8) The fundamental concepts of the calculus are presented in a very concrete manner, and a much greater use than is usual is made of the differential. The ideas are thus more readily visualized than is possible otherwise. The applications are mainly to tangents, normals, areas, and the discussion of equations.

(9) The concluding chapter gives an adequate and careful treatment of solid geometry so necessary in the study of the calculus.

(10) The exercises are numerous, carefully graded, and include many practical applications.

(11) In the introductory chapter are found various short tables and formulas, and at the end are given four-place tables of logarithms and trigonometric functions."

Contents—Chapter I: Introduction, 1–7; II: Geometric facts expressed analytically, and conversely, 8–43; III: Loci and equations, 44–58; IV: The straight line and the general equation of the first degree, 59–85; V: The circle and certain forms of the second degree equation, 86–97; VI: The parabola and certain forms of the second degree equation, 98–116; VII: The ellipse and certain forms of the second degree equation, 117–133; VIII: The hyperbola and certain forms of the second degree equation, 134–153; IX: Other loci and equations, 154–187; X: Empirical loci and equations, 188–205; XI: Poles, polars, and diameters, 206–215; XII: Elements of calculus, 216–260; XIII: Solid analytic geometry, 261–303; Summary of formulas, 303–306; Four-place table of logarithms, 308–309; Table of trigonometric functions, 310–314; Answers, 315–340; Index, 341–347.

Plane Trigonometry. By ARNOLD DRESDEN. New York, John Wiley & Sons, 1921. 8vo. 7 + 110 pages. Price $1.60.

From the Preface: "While the importance of the function concept for elementary mathematics has become recognized by many writers of college algebra texts and of 'unified freshman mathematics' books, it has received little recognition from writers on elementary trigonometry. To emphasize this importance has been the leading motive in writing the present book. A somewhat detailed study of the graphs of the trigonometric functions (Chapter V) and of the inverse functions (Chapter VIII) has been introduced for this purpose. Much more could and should be done in this direction; perhaps the present effort may suffice as a first step.

"The opportunity afforded by the writing of a new text has been used to make some changes in the presentation of the traditional material. Circular measurement of angles is introduced in the first chapter so as to be available for use throughout the course. The fundamental theorems on projections are presented early and are used subsequently so that the student may be familiar